CLAIM AMENDMENTS

1 -- 5. (canceled)

6. (currently amended) An integrated device for receiving millimeter waves, ~~characterized by~~ the device comprising:

a laser circuit [[(13)]] able to generate optical signals; [[-]]

a photodiode circuit [[(27)]] connected to said laser circuit [[(13)]] by means of a waveguide,

means for subjecting the optical signals to optical beat to generate first millimeter wave signals in the photodiode circuit;

antenna terminals ~~(20) and comprising receiving elements (40a, 40b)~~ able to receive ~~millimetric waves; circuit elements (19, 21) able to extract said millimetric waves~~ second millimeter wave signals;

a substrate on which the laser circuit, the photodiode circuit, and the wavequide are integrated; and

contact elements of the photodiode circuit connecting the antenna terminals to the photodiode circuit so that the second millimeter wave signals are fed to the photodiode circuit via the contact elements and are mixed with the first millimeter wave signals so as to cause an electrical between the first and second millimeter wave signals in the photodiode circuit.

7. (currently amended) The device as claimed in claim 6~~, characterized in that said second millimetric~~ wherein the second millimeter wave signals comprise a modulating component and ~~in that said circuit~~ the contact elements ~~(19, 21) comprise demodulating elements able~~ are adapted to allow extraction of said modulating component as a consequence of the electrical beat between the first and second millimeter wave signals in the photodiode circuit.

8 -- 26. (canceled)

27. (new) The integrated device defined in claim 6 wherein the substrate is made of semiconductor material.

28. (new) The integrated device defined in claim 27 wherein the semiconductor material comprises gallium arsenide or indium phosphide.

29. (new) The integrated device defined in claim 6 wherein the laser circuit comprises a laser guide of the ring type.

30. (new) The integrated device defined in claim 29 wherein the laser circuit is adapted to operate in passive mode-locking.

31. (new) The integrated device defined in claim 30 wherein the laser circuit comprises a saturable absorption area.

32. (new) The integrated device defined in claim 6 wherein the integrated device is further adapted for transmitting millimeter waves, the integrated device further comprising

another photodiode circuit connected to the antenna elements.

33. (new) The integrated device defined in claim 32, further comprising

another waveguide connecting the other photodiode circuit to the laser circuit.

34. (new) The integrated device defined in claim 33 wherein the other waveguide has a first amplifier circuit.

35. (new) The integrated device defined in claim 34 wherein the waveguide has a second amplifier circuit.

36. (new) The integrated device defined in claim 34 wherein the laser circuit comprises a coupler able to couple the laser circuit to the first-mentioned waveguide and to the other waveguide.

37. (new) A Module for receiving millimeter waves, the module comprising:

an integrated device as defined in claim 7;

an electronic circuit connected to the contact elements and able to detect the modulating component.

38. (new) A module for transmitting and receiving millimeter waves, the module comprising:

an integrated device as defined in claim 34;

a first electronic circuit connected with the first amplifier circuit and able to generate a modulating signal to be superposed on the millimeter waves to be transmitted;

a second electronic circuit connected with the contact elements and able to detect the modulating component superposed on the received millimeter waves.

39. (new) The module defined in claim 37, further comprising

a bias element connected with the contact elements and adapted to apply a bias voltage to the photodiode circuit.

40. (new) The module defined in claim 38, further comprising

a bias element connected with the contact elements and adapted to apply a bias voltage to the photodiode circuit.

41. (new) The module defined in claim 38 wherein the modulating signal to be superposed on the millimeter waves to be transmitted is an analog signal.

42. (new) The module defined in claim 38 wherein the modulating signal to be superposed on the millimeter waves to be transmitted is a digital signal.